

Variables, Operators, Branches and Loops



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Where innovation starts

Content

- Variables
- Operators
- Branches
- Loops

Variables

- A variable is a named storage location
- Simple variables
 - Generally: <type> <name> [= <value>]
- Types
 - byte (-128, 127)
 - int (-10, 2147483647),
 - float (3.1425, 2.15),
 - char ('a','!'),
 - boolean (true, false)
 - String ("this is a string")

Variable examples

int myAge; ←Declaration

myAge = 40; ←Initialization

String myLanguage = "Processing"; ←Declaration AND initialization

boolean isALanguage = true;

char myChar = 'a';

float myFloat = 3.01;

int yourAge = myAge; ←Initializing with another variable's value

Note

- Give variables meaningful names
- Initialize variables
- Adhere to naming conventions (camelBack notation)
 - isABoy **ok**
 - IsABoy **wrong (sort of...)**
- Case is important (**myVariable != myvariable**)
- myFloat = myInt (**allowed...**)
- myInt = myFloat (**not allowed...**)

Operators

- Operators perform transformations on variables
- +, -, *, /, %
- >, >=, <, <=, ==, !=
- &&, ||
- =, +=, -=, *=, /=, %=
- ++, --
- ?:
- () for precedence

Operator examples

- int x = 12;
- int y = 6;
- Int xDivY = x / y;
- boolean xDivYIsTwo = (xDivY == 2);
- x++; --y;
- x = x - y; y = y+x; x = y - x;
- float temp = 98.2;
- temp = temp % 5;
- x = (y > 6) ? 2 : 1;

Branches

- if (<boolean condition>) {...} else {...}
- switch (<variable>) { [case <value>:<s>;]* default:<s>; }
 - is multiple if {} else {} statements concatenated...

If {} else {} example

```
String val;  
int x = 0, y = 0;  
boolean affirmative = false;  
if (x == 5) { val = "five"; } else { val = "not five"; }  
val = ((x!=5) ? "not": "") + "five";  
if (val == "yes") { affirmative = true; }  
else { affirmative = false; }  
affirmative = (val == "yes");
```

Switch () {} Example

```
int x = 5; String val;  
switch (x) {  
    case 0:  
        val = "zero";  
        break;  
    case 5:  
    case 6:  
        val = "five or six"; // Oops...  
    default:  
        val = "unknown";  
        break;  
}
```

Do's and don'ts

= != ==



- int x = 0;
if (x = 0) { val = "zero"; } else { val = "not zero"; }
- if (val == "blah") {
 x = 5; ← Indent
}
else {
 x = 6;
}

Loops

- `for (<start>; <condition>; <action>) { <s>; }`
- `while (<condition>) do { <s>; }`
- `do { <s>; } while (<condition>);`

for loop examples

```
int i;  
for (i=0; i<5; i++) print(i);
```

```
int i, j;  
for (i=0,j=5;i<=5;i++,j--) {  
    println(i);  
    println(j);  
}
```

while loop examples

```
int i = 0;  
while (i<5) {  
    i++; println(i);  
}  
while (i<5) {  
    i++; println(i);  
}
```

do while loop examples

```
int i;  
do {  
    i++; println(i);  
} while (i < 5);
```

```
do {  
    i++; println(i);  
} while (i < 5);
```